Grace quickly produces best-ever gravity map

By Alan Buis

Previously, the long wavelength components of the gravity field determined from satellite tracking were limited to a resolution of approximately 700 kilometers. In contrast, Grace, by itself, has provided accurate gravity information with a resolution of 200 kilometers. Now, much more detail is clearly evident in the Earth's geophysical features.

The Gravity Recovery and Climate Experiment (GRACE) mission has released its first science product, the most accurate map yet of Earth's gravity field. Grace, which is managed by JPL is the newest tool for scientists working to unlock secrets of ocean circulation and its effects on climate.

Created from 111 days of selected Grace data to help calibrate and validate the mission's instruments, this preliminary model improves knowledge of the gravity field so much it is being released to oceanographers now, months in advance of the scheduled start of routine Grace science operations. The data are expected to significantly improve our ability to understand ocean circulation, which strongly influences weather and climate.

Byron Tapley, Grace principal investigator at the University of Texas' Center for Space Research, called the new model a feast for oceanographers. "This initial model represents a major advancement in our knowledge of Earth's gravity field," Tapley said. "Pre-Grace models contained such large errors that many important features were obscured. Grace brings the true state of the oceans into much sharper focus, so we can better see ocean phenomenon that have a strong impact on atmospheric weather patterns, fisheries and global climate change."

Grace is accomplishing that goal by providing a more precise definition of Earth's geoid, an imaginary surface defined only by Earth's gravity field, upon which Earth's ocean surfaces would lie if not disturbed by other forces such as ocean currents, winds and tides. The geoid height varies around the world by up to 200 meters (650 feet). "I like to think of the geoid as science's equivalent of a carpenter's level. It tells us where horizontal is," Tapley said. "Grace will tell us the geoid with centimeter-level precision."

So why is knowing the geoid height so important? Dr. Lee-Lueng Fu, Topex/Posidon and Jason project scientist at JPL, said, "The ocean's surface, while appearing flat, is actually covered with hills and valleys caused by currents, winds and tides, and also by variations in Earth's gravity field. Scientists want to separate out these gravitational effects. So they can improve the accuracy of satellite altimeters like Jason and Topex/Posidon, which measure sea surface height, ocean heat storage and global ocean circulation. This will give us a better understanding of ocean circulation and how it affects climate."

Dr. Michael Watkins, Grace project scientist at JPL, put improvements in Earth's gravity model into perspective. "Scientists have studied Earth's gravity for more than 30 years, using both satellite and ground measurements that were of uneven quality. Using just a few months of our globally uniform quality Grace data, we've already improved the accuracy of Earth's gravity model by a factor of between 10 and nearly 100, depending on the size of the gravity feature."

In some locations, errors in geoid height based upon previous data were as much as 1 meter (3.3 feet). Now, we can reduce these errors to a centimeter (0.4 inches) in some instances. That's progress. Grace, a joint partnership between NASA and the German Aerospace Center, senses minute variations in gravitational pull from local changes in Earth mass by precisely measuring, to a tenth of the width of a human hair, the separation of two identical spacecraft flying the same orbit approximately 220 kilometers (137 miles) apart. Grace will map the variations from month to month, following changes imposed by the seasons, weather patterns and short-term climate change.

Take one wellseasoned oceanography satellite, the joint NASA/French Space Agency Topex/Poseidon, nearing its 11th year in orbit to study the world's ocean circulation and its effect on climate, mix in a fresh sibling satellite, Jason, and add a dash of ingenuity, and you get what scientists are calling the Jason-Topex/ Poseidon tandem mission.

Since last September, when the older spacecraft was maneuvered into a tightly spaced orbit with Jason's, the two have engaged in a tandem mission. The spacecraft are serving up exceptionally high-resolution data on the height of the world's ocean surfaces, a key measure of heat storage in the ocean, which influences weather and future climate events. The experimental tandem mission data will help scientists better detect and understand ocean currents, eddies and eddies.

In a paper in the American Geophysical Union newsletter Eos. JPLs Dr. Lee-Lueng Fu, project scientist for the Jason and Topex/Poseidon missions, reports the mission is producing ocean surface topography data that reveal twice as many details as seen before.

The Jason-Topex/Poseidon tandem mission doubles the resolution of ocean surface topography data, creating a continuous, simultaneous record of superior-quality radar measurements that will be used to map ocean current speed and direction, revealing important new information about these energetic swirls that are often too small to be resolved by a single satellite," Fu said. "Tandem mission data will allow scientists to revise ocean models, improving their ability to predict ocean currents in the future."

Fu said data from the mission are expected to improve our knowledge of ocean tides in coastal and outer-shelf regions, the changing transports of boundary currents, the horizontal transport of heat in the oceans and other climate-relevant properties. Also, it may validate theories of ocean turbulence caused by the Coriolis force, a phenomenon caused by Earth's rotation that deflects moving objects, such as water or air, to the right in the northern hemisphere and to the left in the southern hemisphere.

The data may provide valuable information about ocean eddies, a type of ocean "weather." These intermittent storms (50 to 200 kilometers, or 30 to 120 miles across) ocean features generally last only a few months, yet play an important role in transporting ocean heat, Eddies help create ocean weather patterns and transport nutrients from deep to shallower waters, where they enhance the growth of marine life.

Beyond Jason and the tandem mission, scientists are developing ways to achieve even higher resolution ocean measurements without flying multiple conventional altimeters. A Jason follow-on project, the Ocean Surface Topography Mission, may carry a Wide-Swath Ocean Altimeter. It would make wide-swath ocean surface height measurements using radar interferometry. The wide-swath instrument would provide a resolution of about 15 kilometers (9 miles) on the ocean surface, an eightfold improvement in data resolution over the tandem mission.

With Jason's instruments fully calibrated, NASA and the French Space Agency released via the Internet Jason's first high-accuracy science data products. The products represent the final, validated records of Jason altimetry data and associated background information. Scientists around the world will use these records to develop products and perform investigations. The Jason science team has accumulated approximately 50 10-day cycles from the mission. These will be reprocessed over the next several months to create a single data record for each cycle. Future records will be made available to the public via NASA's science data center.

For more information about Jason, visit http://www.jpl.nasa.gov/jason/index.html.
Eric Rignot

Researcher receives glacier honor

JPL geophysicist ERIC RIGNOT was recently honored by having an Antarctic glacier named for him. Kongsfjord of the Interdisciplinary Syn- thetic Spetral Radar Phenomenology and Product Verification Group at the Radar Science and Engineering Section 354, received the honor from the United States Board on Geographic Names. He was cited for his use of field and remotely sensed data to study Antarctic glacier mechanics from the 1990s to the present.

Student projects set for Mars rovers

While the ultimate field trip might someday be an actual journey to Mars, NASA is doing the next best thing—giving Exploration science the opportunity to explore Mars by working on specific research projects during the Mars Exploration Rover missions. Projects will be funded from the Student Interns Program, which is a training opportunity for high school and college students interested in science and engineering. The programs designed to involve students will use data from JPL’s Mars Global Surveyor and Mars Odyssey to help characterize aspects of Mars from the atmosphere to the surface that affect exploration missions.

Three JPL-led studies, each led by principal investigators from Section 353, were selected in advanced chemical propulsion technology. LightSail: Foam Core Coaters for Protection of Propellant Tanks and Propulsion Component "LightSail: Foam Core Coaters for Protection of Propellant Tanks and Propulsion Component" is led by MARC MAVIS. "Ultralight Tank Technology Development for In-Space Applications" is led by JOSPH LOHRE. "Lobie GRIMM-LEDSMIR as co-investigator. "Cryogenic Propulsion with Zero booth Storage: Outage Applied Planetary Exploration" is led by CARL KENNER. "ROX ROX: Smaller co-investigator.

In the solar sail area, MICHAEL LLO of Section 353 is the principal investigator for "Structural Analysis and Synthesis Tools for Solar Sails," with NOAO PI’s BRYCE PUBICK of Section 353 as co-investigator.

New stop signs posted

New stop signs have been installed on Explorer Road both east and west bound, which will create a three-way stop at the intersection of Explorer and Mariner Roads near Building 277. JPL Security cautiously staff to operate vehicles safely in a safe and legal manner at this re-configured location.

Ethics training through Sept. 30

All JPL employees are required to complete Ethics training by Sept. 30. Numerous classes are still available, and are listed on the Daily Planet (http://dailyplanet.jpl.nasa.gov). Classes last one hour. Registration is not required; just remember to bring your badge, which is scanned to verify attendance. Online training is also available at the Ethics website (http://ethics.jpl.nasa.gov). The Galaxy Evolution Explorer launched on April 28, 2003. Its goal is to map the celestial sky in the ultraviolet and determine the history of star formation in the universe over the last 10 billion years.

"The images clearly show active star formation in nearby galaxies, and large numbers of distant ultraviolet galaxies undergoing starbursts," said Principal Investigator Dr. Christopher Martin, an astrophysicist in JPL’s Optical and Infrared Astrophysics. "This demonstrates that the Galaxy Evolution Explorer will be a powerful tool for studying star formation in galaxies near and far."

These stunning images provide us with valuable information needed to advance our knowledge of how galaxies, like our own Milky Way, evolve and transform," said Project Manager Dr. James Fanson. "Pictures of the ultraviolet sky reveal objects we could never have seen with visible light alone."

The Galaxy Evolution Explorer launched on April 28, 2003. Its goal is to map the celestial sky in the ultraviolet and determine the history of star formation in the universe over the last 10 billion years.

JPL Genealogy Club—Meeting at noon in Building 361-271.

Wednesday, August 6

Associated Retirees of JPL/Catalina Corporation—Meeting at 10 a.m. at the Catalina Credit Union, 528 Foothill Blvd. La Cañada.

Thursday, August 7

JPL Gun Club—Meeting at noon in Building 163-320.

Tuesday, August 12

JPL Stamp Club—Meeting at noon in Building 163-320.

Wednesday, August 13

JPL Amateur Radio Club—Meeting at noon in Building 210-547.

JPL Toastmasters Club—Meeting at 5 p.m. in the 162 conference room. Call Debbie Littus at ext. 3-5900 for information.

"Succed Over Stress"—This class offered by the Employee Assistance Program is designed to provide an educational and experiential opportuni- ty to manage how stress effectively and maximize coping skills during periods of uncertainty and high work demand. It will be held from 9 a.m. to noon in Trainer 1767. To enroll, go to the Education and Training website (http://training.jpl.nasa.gov) and choose the Professional Development category, search for "Succeed Over Stress," and complete your enrollment. For more information, call the Employee Assistance Program at ext. 3-4568.

JPL Career Fair—Meeting in Building 361-271.

Tuesday, August 15

ACW Career Panel—The final in a series of five panels sponsored by the Advisory Council for Women, held at noon in von Karman Auditorium, will feature and find out how it can facilitate your work. The talk is sponsored by Institutional Computing and Information Services.

JPL Gamers Club—Meeting at noon in Building 361-227.

By Lisa Townsend

JPL’s Galaxy Evolution Explorer has beamed back revealing images of hundreds of galaxies to astronomers, providing the first batch of data on star formation that they had hoped for. The recent ultraviolet sky images reveal hundreds of galaxies near and far. The most recent ultraviolet sky images reveal hundreds of galaxies near and far. These stunning images provide us with valuable information needed to advance our knowledge of how galaxies, like our own Milky Way, evolve and transform," said Project Manager Dr. James Fanson. "Pictures of the ultraviolet sky reveal objects we could never have seen with visible light alone."

The Galaxy Evolution Explorer launched on April 28, 2003. Its goal is to map the celestial sky in the ultraviolet and determine the history of star formation in the universe over the last 10 billion years.
CBS's Survivor series has had a very successful run in the newly spawned reality show market. The show is filmed for 39 days. As the first member of the Survivor concept is fantastic in every aspect. I watched the first season while on co-op (the extended internship program that many of the employees go through before becoming full time) with JPL and was immediately hooked.

I shot my video for the Survivor 2 audition with school in full force I didn't watch the show until I was called by CBS last September to fill a slot on the Amazon season. It was more a matter of luck and fortunate timing that landed me on "the mother of all reality shows."

For the most part, I think that everybody realized what would be impossible not to feel some greater connection. Very much so. After sharing such an amazing experience, it seems folks are calling him to congratulate him on "Survivor: the Amazon," the sixth in the Survivor series.

By Angela McGahan

How did you get the idea to be part of a reality show, and not just any reality show, but the mother of all reality shows, Survivor?

From the physical challenges to the constant mental strain, the Survivor concept is fantastic in every aspect. I watched the first season while on co-op (the extended internship program that many of the employees go through before becoming full time) with JPL and was immediately hooked.

What was your worst day?

I am not that Dave Johnson. Some days it's not easy to be Dave Johnson. Dave Johnson, or DJ, as he is known among his co-workers, works in JPL's Shipping and Receiving Section 2726. "I don't need to go to the Amazon," he says. "I got my own jungle right here."" he adds with a hearty laugh. "I'd love to go with it for a couple of minutes, and then I tell them that I am not that Dave Johnson."

Was it really as primitive and dangerous as we are led to believe? Were there really alligators and piranha everywhere?

The Amazon is a harsh habitat. We ate piranha more than any other fish. Jaguar sightings forced us to keep a nightly fire watch. Infections occurred extremely easily due to the moist and hot conditions... I would have to say having 20-inch knives around inexperienced, urban-raised folk was scary entertaining at times and probably more dangerous than any of the wildlife.

What was the hardest part about living in the jungle for a month? For me, the social dynamics were the most difficult part of the show. Certainly the physical discomfort taxed the body and mind, but the constant stress of not knowing who to trust, who was hiding information from you, dealing with personality conflicts that arose due to shorter tempers, and intimate living interactions, were always a burden. To awaken with a smile after sleeping on bumpy logs with bugs crawling in your mouth, ears and eyes all night is a huge challenge.

Did you make any long-lasting friendships with any of your co-survivors?

Very much so. After sharing such an amazing experience, it would be impossible not to feel some greater connection. For the most part, I think that everybody realized what happened in the game wasn't necessarily indicative to their friendships outside of the Amazon. You can quickly forget how annoyingly bad somebody smells or snores once a shower and bed are in the forecast.

Day 9. For the first 13 days the teams were split up by gender. The dudes had lost four out of five challenges. M ore was low and the realization that we were being embarrassed on national television was running tensions thick. We had not caught any significant food and we hadn't fully adapted to our environment. Around this time, Roger decided to sleep without pants, which made the mornings that much more painful.

Continued on page 4
Passings

CLINTON GENE LOWELL, Jr., a retired quality control engineer, died May 28.
Lowell worked at JPL for 58 years as a quality control engineer. He also
was employed by General Dynamics in 1980. He retired in 1985. Low-
well is survived by his wife, Bar-
bara, son Rod, daughter Jennifer and
four grandchildren. He was buried at
Crest Lawn Memorial Park. PHIL NEUMAUSER, Jr., a retired staff
specialist in the former Public Affairs
Division, died July 23.

Classifieds

For Sale
AIR CONDITIONER in room unit. Owner. 11900
RV. $500. Contact: 626/499-8898.
FOR SALE: Music Studio, 2003, $10,000. Meet
FURNITURE & MISC. ITEMS: black leather
chair, $150 for pair; stainless steel tubular
track lighting and corner unit/cue rack, $900.
FURNITURE: slate blue dining room set, $200.
BEDS: cherry wood queen size bed frame and
mattresses, $300. 626/794-5924.
BEDROOM SETS, several styles, new, $600-1,500.
BEDROOM SET, slate blue, 2 lg. oval tablecloths,
$20. 731-0470.
BOOKS: "Beyond the Horizon," by H.G. Wells.
$7. 626/576-0315.
BEDROOM SET, slate blue, 2 lg. oval tablecloths,
$20. 731-0470.
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MARS ROVERS’ INSTRUMENTS ASSESSED

The first in-flight checkouts of the science instruments and engineering cameras on NASA’s Phoenix Lander and Opportunity spacecraft on their way to Mars have provided an assessment of the instruments’ condition after the stressful vibrations of launch.

The instrument tests run by the Mars Exploration Rover flight team at JPL, finished with performance data received Aug. 9 from below the spectrometers on Opportunity. Each rover’s suite of science instruments includes a stereo panoramic camera pair; a microscope camera and three spectrometers. The tests also evaluated performance of each spacecraft’s engineering cameras, which are a stereo navigation camera pair, a stereo hazard-avoidance camera pair on the front and back of the rover, and a downward-pointing descent camera on the lander to aid in a system for reducing horizontal motion just before impact.

All 10 cameras on each spacecraft—three science cameras and seven engineering cameras—performed flawlessly. The Spirit spectrometers performed well, with each performing at or better than the expected pattern. Spirit’s three spectrometers and all three on Opportunity worked properly.

“All the engineering cameras are healthy,” said JPL imaging scientist Dr. Justin Maki. “When the cameras are in the dark, the images give characteristic signatures that let us know whether the electronics are working correctly.”

The science cameras on each rover all performed flawlessly. A spectrometer on each rover for identifying minerals from a distance, called the miniature thermal emission spectrometer, also worked perfectly on each rover.

Two other spectrometers—an alpha particle X-ray spectrometer and a Mössbauer spectrometer—are mounted on an extensible arm for close-up examination of the composition of rocks and soil. Both instruments on Opportunity, as well as Spirit’s alpha particle X-ray spectrometer, worked properly. The Mössbauer spectrometer on Spirit is the one whose test data did not fit the pattern expected from normal operation.

“The Mössbauer results we received from Opportunity are helping us interpret the data that we’ve been analyzing from Spirit,” said Dr. Steve Squyres of Cornell University, Ithaca, N.Y., principal investigator for the suite of science tools on each rover.
Halpern wins software award
DR. GERARD HALPERN, principal computer scientist at JPL's new Laboratory for Robotic Software, has won a Thomas A. A. Edison patent award in the information technology category.

The award, given by the Research and Development Council of New Jersey, will be presented Nov. 6 at the council's annual awards dinner in New Jersey. Halpern shares the award with two co-workers he worked with at Lawrence Technologies. Bell Labs in New Jersey, with two co-workers.

Halpern's invention, called "Method and Apparatus for Testing Event System Software," has been used to test the flight software for JPL's Mars Pathfinder and Deep Space 1 missions, and will be used on Deep Impact, a spacecraft planned for launch in 2003 which will visit Tempel 1 in an effort to understand what is inside a comet.

"It's a wonderful honor to receive this award, and a true privilege to be able to apply these techniques in JPL missions," said Halpern.

Software team gets NASA honors
JPL, received an award as the best software research organization in NASA at the agency's Cod 8 Software Assurance Symposium held in Morgantown, W. Va., July 30-Aug. 1.

The work of DR. ROBIN LUTZ and DR. DAVID GILLIAM was cited at the symposium, which was attended by BRYAN O'CONNOR, NASA Associate Administrator for Safety and Mission Assurance, and software researchers and practitioners from across NASA. DR. MARTIN FEATHER received an award for his recent research of the year.

The names, proposed by JPL, were recently approved by the International Astronautical Union.

After kids dedicated to Columbia crew
The final crew of the Space Shuttle Columbia was memorialized in the cosmos as seven asteroids orbiting the sun between Mars and Jupiter, in honor of their last mission. The Columbia crew—commander RICK HIRSHBURN, pilot MIKE MASSOON, mission specialists MICHAEL ANDERSON, KALPANA MATHAN, DAVID BROWN and LAUREL MCCOOL; and Israeli payload specialist Oded FORSHAY; will be remembered as a Major contributor to Lutz' work.

The seven asteroids were discovered at the Palomar Observatory near San Diego by the crew of the R.A. Smith telescope on Dec. 6, 1995, in honor of the seven astronauts who perished in the Columbia.

Two Spectacular Examples of High Maturity Model Integrated
JPL's tallest mountain on the planet is goodbye for the week.

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Cassini's propulsion system has won an award from the American Association for the Advancement of Science. The award recognizes "outstanding contributions in basic science related to astromatics, as well as to international cooperation in astronomical sciences.

Halpern is also a Fellow of the American Association for the Advancement of Science, American Geophysical Union and the American Meteorological Society, and an honorary Fellow of the California Academy of Sciences.

JPL Stories—Jack Dawson of JPL's Exploration Imaging Team
Since the mid-1980s, Jack Dawson has been an integral member of the Cassini project, most recently as Project Scientist. His role has been to coordinate and manage the imaging portion of the mission. In this capacity, he has been responsible for all aspects of Cassini's imaging science, including the design, planning, execution and analysis of observations.

Dawson has been involved with the Cassini mission from the beginning, working on the imaging team for the Pioneer and Voyager missions. He has also worked on several other missions, including the Galileo and Hubble Space Telescope missions. Dawson has a Ph.D. in astronomy from the University of California, Berkeley, and a B.S. in physics from the University of California, Davis.

Dawson is currently working on the imaging portion of the Cassini mission, which is scheduled to launch in 2004 and will arrive at Saturn in 2008.

Dawson has been a leader in the field of spacecraft imaging, and has written numerous papers on the subject. He has also been a key player in the development of new imaging technologies, such as high-resolution cameras and multi-spectral imaging.

Dawson's work has been recognized with several awards, including the NASA Exceptional Service Medal and the NASA Group Achievement Award.

Dawson is also an active member of the International Astronomical Union, and has served on several committees and working groups. He has also been a member of the American Astronomical Society, and is currently a member of the International Space Development Conference.

Dawson is married to a NASA scientist and has two children. In his free time, he enjoys photography and hiking. He is a long-time resident of Los Angeles, California.
The conference focused on bringing the technology leaders and the mission experts together, as well as bringing information technology to the forefront of space mission projects, including JPL's large role in developing and implementing such technology.

One of the organizers' goals was to foster a sense of community for space mission information technologists from every discipline, and to bring the space mission development experts and the information technology research communities together.

"The event served to bring together the technologists and their customers, the project folks, to get them to mutually understand the problems each face," said Grenander.

Another goal of the conference was to bring together in one forum cross-cutting themes in information technology that run through all aspects of a space mission lifecycle.

"A conference like this is a perfect place to address such issues and themes because they represent a synthesis of many processes and new technologies," said Mariano, manager of the Space Mission Information Systems Technology Office. "You are best able to identify these crosscutting themes when they are presented collectively."

Included among the attendees were aerospace, defense and other industry representatives from several countries including Japan, Canada, the Netherlands, Australia, South Africa, Denmark, Germany and Sweden.

Among the keynote speakers at the symposium was John Delaney of the University of Washington. He touched on similarities between the challenges for deep-sea exploration and deep-space exploration in his talk, "In EPTUN: A Regional Network of Interactive Ocean Laboratories at the Scale of a Tectonic Plate: A New Paradigm in the Earth and Ocean Sciences."

"I was particularly struck by the similarities between the challenges for deep-sea exploration and deep-space exploration," said Doyle, CSMISS leader. "In both of these areas, information technologies are emerging as an important and very similar component of the solution on how to keep pushing back the frontier."

Other keynote speakers focused on the challenges and the possibilities of information technology. Greg Bolte from Sun Microsystems, the "father" of the real-time Java specification, discussed difficulties of real-time computing in space and the capabilities of real-time Java. In another keynote address, JPL's Adrian Hooke discussed the Interplanetary Network, the Earth's counterpart of the Internet as we know it.

Because one of the goals of the conference was to illustrate crosscutting themes in the discipline, Grenander said he thought the keynote speakers were well selected to represent many fields in information technology. "The speakers presented a great opportunity for collaborations between people that ordinarily would not be in contact with each other," he said.

Panel discussion sessions focused on the future direction of space information technology and a variety of case studies. The tutorial programs ranged from practical topics to the newest cutting-edge technologies. Exhibits were provided from prominent companies like Sun, Lockheed Martin, SGI and Dynamic Systems.

However, the conference was not all work and no play. To the delight of those from out of town, attendees enjoyed a fun-filled "night out" at Universal Studios Hollywood, took a stroll down CityWalk and watched a special showing of "The Space Shuttle 3D" at the IMAX Theater.

The keynote speaker at the private dinner at Universal's Globe Theater that followed was Robert Picard, who plays the doctor in the Star Trek Voyager series. His character is an emergency medical hologram.

"As his character is a product of artificial intelligence and virtual environments technologies, he was a perfect choice given the conference theme," Doyle said. "He gave us a very thoughtful and witty speech."

The event is being hailed a great success. It left participants and organizers alike satisfied.

Doyle said the attendees were strongly engaged with the theme of the conference, perhaps more so than at conferences that already have a fairly mature series of meetings behind them. "I believe the attendees left with a sense of momentum for future Space Mission Challenges IT conferences," he said. "They plan to be back."

Included among the attendees were aerospace, defense and other industry representatives from several countries including Japan, Canada, the Netherlands, Australia, South Africa, Denmark, Germany and Sweden.

Several of those in attendance have already expressed interest in the next conference, to be held in 2005. An international standing committee is also being established to help organize the future conferences.
Letters

Thank you very much to my friends and coworkers who expressed their support following the death of my mother, and thanks, too, to JPL Press for Universe at...
Canaveral Air Force Station at 1:35 a.m. Eastern time Aug. 25 (10:35 p.m. Pacific time, Aug. 24) aboard a Delta II launch vehicle.

The JPL-managed Space Infrared Telescope Facility (SIRTF) successfully launched its science mission at 2:29 a.m. Eastern time (11:29 p.m. Pacific time, Aug. 24), about 64 minutes after takeoff, the NASA Deep Space Network station in Canberra, Australia, received the first data from the spacecraft.

Following the picture-perfect launch, SIRTF was positioned exactly where ground controllers wanted it to be, trailing behind Earth as it orbits the Sun. The spacecraft is working and communicating well with the Deep Space Network antennae, receiving commands and returning telemetry data.

The spacecraft entered a stand-by mode when its star tracker did not lock on to its planned targets within the expected 60 seconds. This possibility was anticipated, and therefore engineers had already prepared a contingency plan, which has been activated. The star tracker did subsequently lock onto its targets and engineers believe the delay is likely due to higher-than-expected background noise levels.

The operations team also investigated two thrusters that were somewhat warmer than expected, and some inconsistent telemetry points from the cryogenic telescope assembly.

"These types of anomalies are expected in a space observatory of this size and complexity," said Project Manager David Gallagher of JPL. "The team is ecstatic with the successful launch and the way the mission is progressing overall. We eagerly await the start of science observations."

On Wednesday, Aug. 27, initial checkout of the pointing and control system was completed. Pointing performance met expectations, and pointing stability or "jitter" over a 10-minute period was excellent. During a test of the reaction wheel system, which controls SIRTF's orientation, one of four reaction wheels was unable to supply the requested torque. (Only three reaction wheels are required to operate SIRTF; any one of the four can be regarded as redundant.) The fault protection system responded correctly by turning off that wheel and putting SIRTF in safe mode. Additional analysis is in progress.

The next milestone will occur when the telescope's dust cover is opened on Aug. 30. This event occurs during the mission's two-month in-orbit checkout, which will be followed by a one-month science verification phase. After that, the science mission will begin a quest to unlock some of the universe's most fascinating objects, including the very first stars and distant galaxies billions of light years away.

For more information about the mission, visit their Web site at http://sirtf.jpl.nasa.gov/caltech.edu.

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**Teen has ‘dream science vacation’ at JPL**

By Mark Whalen

Many visitors to Southern California have Disneyland on their itinerary. So when R.J. Gross and his family made their way here from Pennsylvania earlier this month, the Happiest Place on Earth was definitely a target destination.

This wasn't the priority for R.J., however. As a matter of fact, the 15-year-old aspiring robotics engineer chose JPL as his destination after winning the Discovery Channel's Science Fair Challenge, a national middle-school science contest, that allowed him to choose a "dream science vacation" anywhere in the United States.

Gross' entry in a regional science fair about the effect of light-emitting diodes on plant naria regeneration caught the attention of the Discovery Channel, which offered him an application in the contest. Out of 4,000 entries, Gross was selected as a finalist among 40 students in Washington, D.C.

A 250-word essay about his dream science trip sealed his and his family's first visit to the west coast.

Gross calls robotics his hobby. He said his recent efforts have produced homemade paintball guns and a fully autonomous machine that can go through a maze, extinguish a candle and return to its starting point.

"I love robotics," Gross said. "When I looked for a place to go to JPL, because they are at the frontier of new robotics, paying the way for the future." Gross, joined by his father, Roy, visited the Lab Aug. 11-12 for a special tour of JPL, and the teenager certainly got his fill of what robotics is all about.

At the Mars Yard, rover integration and test engineer Jessica Gissilson showed off the full-scale models of the Mars Exploration Rovers. Terry Hunter, who showed him robotics in development that walk up inclines. "Those walking robots were ingenious," R.J. said. "Mind boggling."

He was also somewhat surprised, and delighted, to learn that the Lab is so much more than robotics. He visited with oceanographer Dr. Bill Patzert, who explained JPL's Earth-imaging satellites. "It's interesting how they integrate science and robotics to find El Niño," Gross said. His visit also included the Spacecraft Assembly Facility and the ion engine test chamber. Before departing, he chatted with JPL Director Dr. Charles Elachi.

Gross and his family, from Lansdale, Pa., a Philadelphia suburb, eventually did see Disneyl and other tourist destinations, but the youth's "behind the scenes" JPL visit stood out.

"I got to go where most people don't get to get," Gross said. "It was really cool."

**Software aids firefighters**

By Nancy Lutato

IF A FOREST CATCHES FIRE and no one is around to see it, can it call for help? The forest cannot call, but thanks to new technology developed in collaboration with the Goddard Space Flight Center, firefighters may get the word faster through new, high-tech eyes in the sky.

The new software helps link NASA's Earth science satellites together to form a virtual web of sensors with the ability to monitor the globe far better than individual satellites. An imaging instrument flying on one satellite can detect a fire or other hazard, and automatically instruct a different satellite that has the ability to take more detailed pictures to take a closer look. If the images show that a potential hazard does exist, the corresponding satellite provides data to ground controllers, who then report the fire to forest officials and an interested science team.

"Essentially, we are adding the response mechanism to the detection process," said Dr. Steve Chien, JPL principal scientist in artificial intelligence. "This is a first step to enabling users of satellite remote sensing data to specify the kind of data they want, such as forest fires or floods, rather than the traditional request to say, look at northern Montana."

One of the core components in this effort is the Science Goal Monitor system being developed at Goddard, which enables scientists to specify what to look for and how to react in descriptive rather than technical terms. Then the system monitors science streams of data and identifies occurrences of the key events previously specified by the scientist.

Using the sensor web method, investigators no longer have to rely on after-the-fact data analysis to determine what happened. The information can be used to rapidly respond to hazardous events such as forest fires.

For example, moderate-resolution imaging instruments that fly on both NASA's Terra and Aqua spacecraft observe the entire globe every day. The "instrument's" data is automatically processed on the ground within hours of acquisition by the Rapunzel Center at the University of Maryland. If this processing detects a hot spot, scientific criteria can be used to automatically redirect the Earth Observing 1 satellite to provide high-resolution images. When that information comes back to a scientist for interpretation, it is made available to forest officials to determine the appropriate response. All this can happen in 24 to 48 hours, compared to the traditional long time of 14 days for preplanned observations.
Newsticker

New test facility opens
Section 513 has dedicated its new electromagnetic compatibility (EMC) test facility, a 10 x 24 x 12 high radio frequency shield room located in the building 325, located near JPL's other major environmental test facilities in Buildings 144 and 150.

The facility is equipped with absorber material that additionally makes it a radio frequency anechoic room. The new building will be used for testing larger items than will fit in the existing main EMC lab in Building 179. For example, the High Energy Solar Spectroscopic Imager (HSSI), Microwave Limb Sounder and Thermal Emission Spectrometer instruments and the Mars Exploration Rovers have been tested in the new shield room. Those tests occurred in the shield room's former locations of Buildings 144-109 and 179-082. The shield room now has its permanent home in Building 325.

In addition to its new location, the shield room has received two major upgrades: there is now a convenient, large 10 ft. hinged double-door opening for test article access, and there is radio frequency anechoic material on the walls. Previously, test article entry was accomplished by teleporting it 100 meters to a mobile glass shower door which will have a half-day effort for entry, and a half-day at exit time when the article leaves the facility, as well as the wear and tear associated with the multiple moves of the wall panels. The radio frequency absorber will now house research resources as part of the facility's capacity of EMC measurements. Some of the radio frequency absorbers are on-wheel-mounted panels that can assist projects at locations away from Building 325.

The facility can also be made available to outside organizations, as was the case for HSSI. The existing EMC test lab in Building 179-120 will have to be the most frequently used facility for that purpose. It is used to test smaller articles (as much as two meters size in the largest dimension). The test facility is expected to be the most frequently used lab in the building 325. The facility can also be used to test smaller components, which has a direct impact on the number of EMC tests that can be performed.

For more information, please contact the JPL EMC Test Facility at 325-3270.
NASA's Explorer Schools Program debuts

By Charli Schuler

Educators were introduced to resources like the Mars Student Imaging Project, which allows students to command an instrument on the Mars Odyssey via their classroom computer, and the Goldstone Apple Valley Radio Telescope project, which lets students control and collect science data from a Deep Space Network antenna.

At JPL, they were welcomed by Dr. Robert Parker, director of the NASA Management Office at JPL and a former astronaut. Among the highlights of their Lab visit were the Project Design Center, Inflatable Lab, Micro-Devices Lab, In-Situ Instruments Lab, Fabrication Shops, Spacecraft Assembly Facility, Environmental Test Lab, Spaceflight Operations Facility, Multimission Image Processing Lab and presentations on Stardust and Deep Impact.

“Five years ago, I could only begin to understand all this information,” said National Science Teachers Association member and Explorer Schools Educator Facilitator David Black, who helped the JPL Education Office schedule the sessions. “Now there are tremendous opportunities opening up for teachers and students that I wish I would have had as a student in high school.”

The group also enjoyed a special opportunity to connect with the International Space Station through NASA’s Ames Research Center for a question-and-answer session via downlink. Such exciting events were mixed with discussion sessions throughout the week, allowing the participants to process information and talk more about how to inspire the next generation of explorers.

“Make no mistake, the JPL staff worked us to the bone. It seemed as if we received two weeks' worth of information packed into one,” said Jodie West, a 6th-grade teacher from Washington Middle School. “The long hours were worth it because now we are armed with so many projects to stimulate the interest of our kids in the subject areas of math, science and technology.”

The Explorer Schools program, sponsored by NASA Education Enterprise and the National Science Teachers Association, establishes a three-year partnership between the space agency and 50 carefully selected teams of educators who represent 30 states across the country. To maximize the impact on a broad range of students, more than half of the teams selected to participate in the program were from high poverty and minority areas. The teams visit NASA field centers during the summer to meet with science professionals and learn about the work at each center.

“This summer was just the beginning,” Seidel said. “We are going to be working closely with the schools starting in September and continuing on for the entire span of their three-year commitment to help them implement their action plans. “We exposed them to lots of materials, content and opportunities,” he added. “But in order to really affect student appreciation of Earth and space science we have to find the handful of key programs and activities that resonate with the kids at each school. We will be working with the teams to fine-tune what NASA materials they use and how to use them effectively.”

NASA plans to expand the NASA Explorer Schools program by 50 schools each year for an ongoing three-year cycle of 150 schools. A complete list of the first 50 Explorers Schools is available at http://explorerschools.nasa.gov.

Woud you hand your 12-year-old the keys to an automobile? How about a spacecraft or a deep-space antenna? With the exception of the car, NASA is all for it.

As part of the new NASA Explorer Schools program, local educators were selected to spend a week at JPL, obtaining the keys to the many exciting and interactive learning resources the agency has to offer. This is a completely new program based on a team approach, in which teachers and administrators come together to impact local schools,” said NASA Explorer Schools Program Manager Peg Steffen at NASA Headquarters. “The work at JPL is very much team-based, which provides wonderful examples of how teams come together to achieve common goals.”

From July 26 through Aug. 1, 18 teachers and administrators from Washington Middle School, Pasadena; 153rd Street Elementary School, Gardena; Shirley Avenue Elementary School in Reseda; and Sycamore Hills Elementary School in Fontana attended lectures and workshops at JPL about the history and goals of space exploration, as well as the development of a NASA project from start to finish. Substantial time was spent on NASA and JPL educational activities and resources, as well as education issues in California. This included field trips to the Educator Resource Center in Pomona and the Mt. Wilson Observatory.

“We couldn't be happier with the way the summer workshop went and with the enthusiasm and professionalism of the team members,” said David M. Seidel, manager of pre-college programs in the JPL Education Office. “They all got into the spirit of the program, and we covered a lot of territory. “As a veteran teacher who has not had any formal math and science education for 30 years, I found the information fascinating and stimulating,” said Linda Sutherland, a resource teacher at 153rd Street Elementary School. “The resource center was, and will continue to be, an invaluable source of materials to implement our NASA Explorer School Program.”

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At JPL’s Educator Resource Center in Pomona, NASA Explorer School team members use Mars image and data to select a safe and scientifically interesting landing site. From left to right are staff members from 153rd Street Elementary School in Gardena: principal Ira Berman and teachers Regina Jeffrey, Kapila Bhuta and Linda Sutherland.

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For the period from June 16 through July 3, the following JPL recipients were announced: James Akka, Gaemi Nara Kim, Ariadna Hernandez, and Robert Roth. Frank Stolt, Henry Valley

> Classified ads will be available the evening after publication for the followingFriday by the Office of Communications and Education of the Jet Propulsion Laboratory, 4800 Oak Grove Drive, La Canada, CA 91011.


Letters

I would like to thank everyone for their prayers during the time of my brother’s illness and his passing. The plant that I worked on the Mars Observer Camera in Chelina, TX, was a unique experience and will be remembered.

Karen M. Woodson

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Notice to Advertisers

Advertising is available for $1.40 per word, which includes up to 60 words each will be published for each advertisement. Business combinations may be combined into a single submission. Ads must be submitted via e-mail to wixen@jpl.nasa.gov and received by 2 p.m. on the Monday before publication for the following Friday.

All housing and vehicles advertisements require that the qualifying person places the ad as listed on an owner on the warranty documents.

P
apings

LEATHER: bookcase, double, solid oak, 48 in. x 16 in. x 72 in. new; $300. 626/793-7344. Kim.

P
apings

DIGITAL SURROUND SYSTEM: napoleon, black, like new, $30/obo. 626/791-6101.

WANTED

FREE:

1999 HONDA Prelude coupe, 2 dr., automatic, air, tilt, AM/FM stereo, $6,300. 790-5538.


LA CRESCENTA, cozy house on a private cul-de-sac, 3 bd., 2 ba., nice kitchen, stove, refrigerator, washer, dryer, carpet, central a/c. $1,950 per month. 249-4179.

LA CRESCENTA, 2 bd., 2 ba., 15 min. of JPL. 626/577-6638, Suzanne.

LA CRESCENTA, upper Briggs Terrace, 1 bd., 1 ba., 1 car, fireplace, central a/c, parking, 1/2 mile to Caltech, mountain view, $950/mo. 248-6062, Elizabeth.

LA MIRADA, 2 bd., 2 ba., 1 car, fireplace, central a/c, parking, 1/2 mile to JPL, walking distance to El Monte bus stop. $1,300/mo. 626/844-6169, Laura.

LA VERA, 2 bd., 2 ba., 1 car, fireplace, central a/c, parking, 1/2 mile to JPL, walking distance to El Monte bus stop. $1,175/mo. 626/844-6169, Laura.

LA VERNA, 2 bd., 2 ba., 1 car, fireplace, central a/c, parking, 1/2 mile to JPL, walking distance to El Monte bus stop. $1,175/mo. 626/844-6169, Laura.

LA VERNA, 1 bd., 1 ba., 1 car, fireplace, central a/c, parking, 1/2 mile to JPL, walking distance to El Monte bus stop. $975/mo. 626/844-6169, Laura.

617/642-6651, cell. 1810 or meyoung@sbcglobal.net.

WEST LA, guesthouse, share 3 bd., 2 ba. $120/nt/2, $15/nt/add'l person. 949/348-5301.

MAMMOTH, Snowcreek, 2 bd., 2 ba., +loft, jacuzzi, fireplace, central a/c, parking. $120/nt/2, $15/nt/add'l person. 949/786-6548. Kristy.

COSTA RICA, Pueblo Real, Quepos, 2 bd., 2 ba., +loft, jacuzzi, fireplace, & pool, central a/c, parking. $175/nt/2, $10/nt/add'l person. 949/786-6548. Kristy.

425-7176, Terri. 342-4236.

WANTED

For Sale

PIECH EQUIPMENT: 30 years: Full line of racing equipment, all brands, all models, used & new, at $25,000. 902/457-3380.


MAMMOTH, Snowcreek, 2 bd., 2 ba., +loft, jacuzzi, fireplace, central a/c, parking. $120/nt/2, $15/nt/add'l person. 949/786-6548. Kristy.

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For Sale

FURNITURE: bookcase, double, solid oak, 48 in. x 16 in. x 72 in. new; $300. 626/793-7344. Kim.

FURNITURE & APPLIANCES: birch 16 x 12 ft. by side by side GE refrigerator/sink/oven/counter, new; $3,000. 625-3777.

SPEAKER/AMP and microphone, two channel, 50 wats, used, about 5 years, $50. 626/290-4932.

HOGS: female preferred, non-smoking, $500 incl. utilities. 916/307-6542.

STATUS, COLEMAN DAVID CARTER, 6'4"/200, 30 years: Educators, superintendents, and school superintendents above the rank of chief. 310/839-9250, Barbara.

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